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Outcomes of the in-depth reviews carried out by the Conference of European Statisticians (CES) Bureau

In-depth review of leading, composite and sentiment indicators

Prepared by the Secretariat

Summary

The present note is the updated in-depth review paper on leading, composite and sentiment indicators and official statistics. The Bureau of the Conference of European Statisticians conducted the in-depth review at its meeting in January 2014. The purpose of the reviews carried out by the Bureau is to improve coordination of statistical activities in the region of the United Nations Economic Commission for Europe, identify gaps or duplication of work and address emerging issues.

The note summarises the international statistical activities in the area, identifies issues and problems, and makes recommendations on possible follow-up actions in this area.

The outcome of the review is provided in document ECE/CES/2014/10/Add.1.

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I. Introduction

1. The paper provides the basis for the review of leading, composite and sentiment indicators by reviewing countries' experiences and summarising the international statistical activities in this area. The paper identifies issues and problems, and makes recommendations for possible follow-up actions.

2. The CES Bureau selected leading, composite and sentiment indicators and official statistics for an in-depth review at its February 2013 meeting. To provide basis for the in-depth review, the UNECE Secretariat conducted a short survey of country practices in leading, composite and sentiment indicators. The survey was carried out on 6-20 December 2013, and 38 replies[1] were received from CES countries.

3. The aim of the review is to discuss the role of official statistics in this context. Different indicator sets have been developed by countries and international organizations to meet the demand for evidence-based policy making in a wide variety of areas. New initiatives to develop leading, composite or sentiment indicators are discussed at various fora internationally. Some countries have also been concerned about the possible compromise to statistical institutions' objectivity or reliability when engaging in the production of leading, composite or sentiment indicators.

4. Composite indicators have their roots already in the 1950s and 1960s when the influential environmental movement emerged in response to increasing concerns about the detrimental effects of economic production on the environment. In parallel to this development, the criticism of macroeconomic measures such as GDP increased since they do not incorporate environmental or many other external effects. The many initiatives to correct economic statistics towards providing a better indicator for welfare or sustainable welfare led to the development of a variety of economic composite indicators in the 1960s and 1970s.

5. Accounting for environmental aspects was stimulated by two events in 1972: the report of the Club of Rome on "Limits to growth" and the United Nations (UN) Conference on the Human Environment where the participants agreed that economic development and environmental quality must be managed in a mutually beneficial way. The resulting initiatives were very much academic products and included e.g. the Measure of Economic Well-being (MEW) and the Sustainable National Income (SNI) measure. Various approaches have been developed since, but none of the alternatives have managed to become the official enlarged GDP. These developments have started to impact statistical work.

6. The demand for leading, composite and sentiment indicators continues to grow; the question is how the national statistical offices should react to this challenge? This is a cross-cutting area that is not explicitly included in the mandate of any international organization either. At the same time, different countries and organizations have acquired practical experience with compiling leading, composite and sentiment indicators.

7. The review provides an overview of current work in this area as a starting point for discussing how the official statistical community could meet these challenges. The review

[1] Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Canada, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Hungary, Israel, Italy, Japan, Kazakhstan, Latvia, Lithuania, Mexico, Moldova, Mongolia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovak Republic, Sweden, Switzerland, Turkey, Ukraine and United Kingdom

does not aim at being exhaustive; it rather provides an overview of the main developments in the field composed of numerous, rich new initiatives. The review sourced information from the Internet, the short survey of CES member countries and made use of two stocktaking reports on composite indicators carried out by the United Nations Development Programme (UNDP) and the Joint Research Centre of the European Commission.

II. Scope/Definition of the statistical area covered

8. Composite, leading and sentiment indicators which compare country performance are becoming more and more common, and are increasingly used for policy making. These indicators attract a lot of attention in the media and among policy makers.

9. Leading indicators are time series that show a leading relationship with economic movements such as growth, business-cycle and growth-cycle. Typically, leading indicators are constructed to predict the cycles of industrial production or GDP, which are seen as proxy measures for economic development. A leading indicator may be defined as a time series displaying a reasonably consistent leading relationship with the reference series for the macroeconomic cycle in a country (based on an OECD definition). A scoreboard of indicators with leading abilities can also be used for anticipating turning points in economic activity or the different indicators can be combined into a composite indicator. Leading indicators are used to predict changes in the economy, but their accuracy varies. Examples of variables with leading features may include building permits, unemployment insurance claims, money supply, inventory changes, and stock prices. However, in some countries the leading abilities of these variables may be questionable and are not always supported by empirical evidence. For instance, in Europe the building permits variable has a very low leading power due to its administrative nature.

10. Composite indicators are formed when individual indicators are compiled into a single index on the basis of an underlying model of the multi-dimensional concept that is being measured (OECD definition). The composite indicators measure multidimensional concepts which cannot be captured by a single indicator, e.g. competitiveness, industrialisation, sustainability, single market integration, urbanization, knowledge-based society, etc. Composite indicator can summarise complex, multi-dimensional realities with a view to supporting decision makers by simplifying the reality. Composite indicators may show direction better than a scoreboard of many separate indicators, and make it easier to compare progress of countries over time. In addition to time series cyclical or short-term composite indicators are often produced. Composite indicators can be classified into leading, coincident and lagging indicators.

11. Composite indicators are sometimes poorly constructed, can be easily misinterpreted or may invite simplistic policy conclusions. There is a risk of misuse, e.g. to support a desired policy, if the construction process is not transparent and/or lacks sound statistical or conceptual principles. Also, the selection of indicators and weights could be subject to political dispute and may lead to policy failings. Composite indicators are not necessarily based on a weighted average of a variety of statistical variables but can also be derived by means of statistical models such as factor models, regression models, and time-series models. Traditional macroeconomic indicators may also be seen as composite indicators, such as GDP or gross national product. This in-depth review, however, does not include traditional macroeconomic indicators in the scope of composite indicators as they are produced following international statistical standards in compliance with the Fundamental Principles of Official Statistics.

12. Sentiment indicators are usually designed to show how a group feels about the market, business environment or some other factor. Examples of sentiment indicators

include the Economic Sentiment Indicator (ESI) for the Euro Area and European Union (EU), and the related consumer or business confidence indicators produced by many EU countries. Economic sentiment indicators can provide a wealth of information for macroeconomic policy formulation and analysis. A sentiment indicator seeks to estimate future behaviour that may be impacted by various factors, such as unemployment, inflation, macroeconomic conditions or politics. Sentiment indicators are also derived from business tendency surveys that are carried out to monitor the current business situation and forecast short-term developments, such as turning points in the business cycle. Sentiment indicators are often composite indicators as they are a weighted average of several issues.

13. It is not always easy to classify indicators to leading, composite or sentiment indicators. Consumer and business confidence indicators could also be classified as leading indicators as they are often used for their leading abilities. For instance, the Real Sector Confidence Index, produced by the Turkish central bank, is used as a leading indicator for the overall economic development of the country. It would be possible to classify leading indicators by distinguishing those that rely on one statistical variable and those that are composite leading indicators. Composite indicators could also be further divided into leading, coincident and lagging indicators. These types of classification issues could be considered in further work. Sometimes indicator sets or indicator scoreboards are used instead of composite indicators. The review does not focus on the development and use of scoreboards, although the issue is mentioned as an alternative approach for statistical offices in the survey results. Moreover, the review is not extensive e.g. from the stocktaking reports of UNDP and the European Commission this review only includes regularly updated indicators that are relevant for the CES countries.

III. Overview of country practices

14. The UNECE survey reviewed the involvement of national statistical offices in producing leading, composite and sentiment indicators with the following question: Does your office produce any leading, composite or sentiment indicators? The survey provided useful information on the scope of work of statistical offices in the area. Some replies also covered the activities of national central banks. These cases are mentioned in the text.

A. Leading indicators

15. National statistical offices (NSOs) typically produce statistics that may be used for identifying indications of future developments, for instance flash estimates of key statistics and monthly or quarterly statistics on retail trade, construction, manufacturing, services, capital expenditure, (un)employment, GDP, consumer and producer prices, imports and exports. Several statistical offices produce also indicators of new orders, investments and building permits that may include a leading component. Flash estimates are not considered in this review as leading indicators. However, other indicators that mainly aim at anticipating developments are discussed as leading indicators, although they may be produced using the methodology of composite indicators, for instance composite leading indicators (CLI).

16. Four main types of leading indicators produced by NSOs or central banks can be identified from the survey:

(a) indicators reflecting general economic activity in advance;

(b) indicators monitoring business conditions that may reflect the possibilities for future economic growth;

(c) indicators based on variables that may predict future economic activity, such as investment or job vacancies; and

(d) indicators providing early signs of changes in wellbeing.

17. Several NSOs produce leading indicators aimed at reflecting general economic activity or turning points in advance. For instance, Colombia reports that it is currently designing an Indicator of Monthly Activity in the Economy (IMAE) which will be released in July 2014. The goal is to estimate the economic behaviour of the country in advance of and in line with the quarterly national accounts.

18. Portugal compiles an Economic Activity Indicator for anticipating changes in the economic cycle and using a wide range of information on industrial production, fuel and electricity consumption, employment and unemployment and car sales.

19. France produces a Turning Point Indicator which attempts to anticipate, as early as possible, upcoming changes in the economic development. This qualitative indicator is not observed directly. It is presented in the form of a curve which plots, for each date, the difference between the probability of the economic trend being positive and the probability of it being negative.

20. The Bank of Israel releases two monthly leading indicators: 1) a Markov Switching turning point index Model (MSM) on the manufacturing stocks index; 2) a Composite Leading Indicator (CLI) according to the OECD methodology for early signals of turning points in economic activity. The Bank currently works towards changing the reference series of these two leading indicators to monthly GDP instead of industrial production.

21. Mexico (INEGI) and Australia also mention producing a Composite Leading Indicator (CLI) for anticipating the direction and turning points of economic development. In Switzerland, the Business Cycle Research Institute, Konjunkturforschungsstelle (KOF) releases a similar Leading Indicator for the Business Sector. Kazakhstan produces a CLI of Industry to allow anticipating the development and possible changes in business activity a few months ahead. Poland is currently carrying out methodological work to develop a CLI, and in the Slovak Republic the Research Institute of the NSO (Infostat) has compiled an experimental CLI for 2008–2012. Canada reports having discontinued the production of the CLI in May 2012.

22. A number of NSOs carry out surveys to monitor business conditions which may provide indications of future development. Japan releases, among others, "Indices of Business Conditions" that enables anticipating the volume and development of business activities. In Canada, business conditions are measured by the Bank of Canada.

23. Similar data are provided by Surveys of Business Activity of Enterprises e.g. in Belarus, Russian Federation and Ukraine. The NSO of Ukraine conducts a quarterly survey of the chiefs of enterprises in industry, construction, retail trade, transport, agriculture and services. The Russian Federation has a similar survey as well as a survey of Investment Activity and Financial Leasing. The surveys provide data e.g. on business confidence, output, demand, new orders, stocks of finished products, prices, persons employed, investment and economic conditions.

24. Some NSOs produce indicators using variables that may predict future economic activity, such as investment or job vacancies. Investment indicators were mentioned by Belarus, Netherlands, Norway, Portugal, Russian Federation and Ukraine. The Investment Indicator of Portugal combines data on investment in machinery and equipment, transport material and construction. The Netherlands mentioned the vacancy indicator as a quick indication of the direction in which the private sector is moving in terms of new job creation.

25. Some NSOs compile indicators that may provide early signs of changes in wellbeing. Like most EU countries, Germany, Latvia and Lithuania produce annually an indicator called "At-Risk-of-Poverty" rate, and they also release an indicator called "At-Risk-of-Poverty -or-social-Exclusion rate" The latter could also be classified as a composite indicator.

B. Composite indicators

26. Many of the traditional statistics produced by statistical offices are, in fact, composite indicators as they have been formed by combining or aggregating a number of components that may have been measured using different methods or units. These statistics include for instance GDP, price indices, industrial production index etc. This section does not focus, however, on these traditional indices, but rather on those composite indicators that require valuing and weighing together very different issues that are not always quantitative or not easy to measure.

27. In addition to the composite indicators with leading abilities described above, NSOs report producing composite indicators to reflect the current state of the economy or more specific issues such as consumption, exports, regional development and human development.

28. For instance, Statistics Denmark and Statistics Netherlands released a "Business Cycle Tracer"[2] which provides a graphical method for presenting the aggregate economic state of the country. In Denmark, the composite indicator is based on the tendency surveys of manufacturing, construction, services and retail trade, and in the Netherlands on a set of 15 monthly indicators describing the business cycle. Both countries have also carried out research on producing a "Monthly Indicator of Economic Growth" by putting together the available statistics on the supply and output side and using econometric techniques where data are lacking. Statistics Norway also reports producing a business cycle barometer.

29. The Bank of Israel compiles a monthly "Composite State of the Economy Index" which estimates changes in the output of the business sector based on nine sub-components. Mexico (INEGI) regularly maintains a "System of Composite Indicators and a System of Cyclical Indicators" that also include a leading component.

30. Statistics Netherlands releases an "Exports Radar"[3] based on a set of 6 indicators of exports of goods, a "Household Consumption Radar"[4] using a set of 6 indicators of household consumption and an "Investment Radar"[5] using a set of 6 indicators of private sector investment. These radars combine statistics with data on opinions derived from confidence surveys.

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[2] Denmark, The Business Cycle Tracer: www.dst.dk/en/Statistik/emner/konjunkturbarometre/konjunkturcyklus.aspx#
The Netherlands, The Business Cycle Tracer: www.cbs.nl/en-GB/menu/themas/dossiers/conjunctuur/publicaties/conjunctuurbericht/inhoud/conjunctuurklok/conjunctuurklok2.htm

[3] The Netherlands, Exports Radar: www.cbs.nl/en-GB/menu/themas/dossiers/globalisering/cijfers/extra/exportradar.htm

[4] The Netherlands, Household Consumption Radar: www.cbs.nl/en-GB/menu/themas/dossiers/conjunctuur/cijfers/kerncijfers/consumptieradar.htm

[5] The Netherlands, Investment Radar: www.cbs.nl/en-GB/menu/themas/dossiers/conjunctuur/cijfers/kerncijfers/investeringsradar.htm

31. Statistics Estonia has produced a "Local Government Viability Index" in 2004 and 2013. It is calculated based on eight components containing demographic and economic indicators on regional development.

32. Portugal compiles a "Private Consumption Indicator" – divided into durable and non-durable consumption. This indicator combines information on retail trade turnover, electricity and fuel consumption and car sales etc.

33. In Switzerland, the Business Cycle Research Institute, KOF, produces an Index of Globalization for 208 countries based on different indicators reflecting the dimensions of globalisation: economic, social, and political.

34. Moldova and Mongolia produce a Human Development Index for the country in collaboration with UNDP.

C. Sentiment indicators

35. In the survey, 18 out of 38 statistical offices reported producing some sentiment indicators. Many NSOs produce consumer and business confidence indicators in line with the Joint Harmonised EU Programme of Business and Consumer Surveys (BCS). This area is, therefore, well harmonised. The surveys cover five economic sectors (manufacturing industry, services, retail trade, building and consumers) in all EU Member States and the candidate countries. The sum of these five sectors forms the "Economic Sentiment Indicator". In addition, a purchasing manager index (PMI) is available for the Euro area and for some European countries.

36. Subjective indicators are also produced commonly by EU countries as part of the European Union Statistics on Income and Living Conditions (EU-SILC). Austria, for instance, mentions indicators of overall life satisfaction, subjective status of health, subjective quality of societal organisation, subjective natural and living environment and subjective physical insecurity indicators. The 2013 EU-SILC module focused on wellbeing measuring issues such as life satisfaction and satisfaction with financial situation, accommodation, job, commuting and time use, trust etc. EU-SILC also measures issues relating to expectations, such as plans to change job, quality of life and satisfaction with material, health and environmental conditions, etc.

37. In some countries confidence indicators are produced by the central bank or by private companies etc. In Sweden, for example, the National Institute of Economic Research, which belongs to the system of official statistics, produces the Economic Tendency Indicator, Confidence Indicators for a number of sectors and the Consumer Confidence Indicator. In Switzerland, sentiment indicators are produced by the Business Cycle Research Institute (KOF).

38. The Australian Bureau of Statistics produced a Business Expectations Indicator for a short while but there were other indicators, produced outside official statistics, which filled the information need. Georgia (Geostat) also used to produce Producer Confidence Index for Industry.

39. Statistics Sweden produces, as a commissioned service, an Export Manager Index focusing on the business cycle at the export markets, Regional Business Tendency Surveys which is similar to national Business Tendency survey and it also compiles a Care Tendency Survey.

IV. Overview of international statistical activities

A. International organisations

1. European Commission and Eurostat

40. In the European Union a key development has been the GDP and Beyond communication of the European Commission in 2009 that presents a road map designed to "support the Commission's aim to develop indicators relevant to the challenges of today" with five key actions:

(a) Complementing GDP with environmental and social indicators

(b) Near real-time information for decision-making

(c) More accurate reporting on distribution and inequalities

(d) Developing a European Sustainable Development Scoreboard

(e) Extending National Accounts to environmental and social issues

41. These actions are linked with leading, composite and sentiment indicators. Different enlarged GDP indicators could be produced, such as the National Welfare Index (NWI) which is a composite indicator that adjusts GDP for a number of welfare services and losses. Near real-time information in the above list could refer to leading and sentiment indicators.

42. The scoreboard approach, on the other hand, can be seen as an alternative or complementary to compiling composite indicators. Eurostat has carried out some feasibility studies of new types of indicators, for instance on the feasibility of wellbeing indicators, which suggests using the scoreboard approach for measuring the different drivers of wellbeing and developing a composite outcome indicator on Satisfied Adjusted Life Expectancy.

Leading indicators

43. Eurostat produces a Business Cycle Clock to give the possibility of investigating cyclical behaviour of different variables and to compare them in order to identify some leading behaviours. Furthermore, Eurostat is working with partners aiming to compile a handbook on cyclical composite indicators. The EU regulation (EC) No 1165/98 for short-term statistics requires the production of monthly and quarterly statistics that are not actually leading indicators, but provides some statistical variables which may or may not have some leading properties. For example, building permits may sometimes be used as a leading indicator of economic activity. The industrial new orders variable that used to belong to the EU requirements was also intended to serve as a leading indicator of future production. However, the predictive capacity of the variable was considered limited, and the European Statistical System Committee agreed that the requirement to produce that variable should be removed. Some EU countries, however, have decided to continue producing the indicator, and the European Central Bank (ECB) makes use of the data.

Composite indicators

44. The European Commission compiles some composite indicators for policy monitoring. For example a "European Innovation Scoreboard" (EIS) and a "Summary Innovation Index" (SII) were developed in 2000 to evaluate and compare the innovation performance of the EU Member States. The SII combines 20 indicators of four dimensions: human resources for innovation, creation of new knowledge, transmission and application

of knowledge and innovation finance, output and markets. Furthermore, an "Internal Market Scoreboard" and an "Internal Market Index" are produced as a weighted sum of 12 base indicators to monitor that the internal market works in practice.

45. The use of composite indicators to assess progress towards the knowledge-based economy is an emerging field at the Commission. Two composite indicators have been developed: 1) one aggregating the various forms of investment in the knowledge-based economy; and 2) the other aggregating measures of performance in the knowledge-based economy. These were developed with the involvement of Eurostat and the Joint Research Centre, and with assistance of researchers. Furthermore, the European Commission has monitored since 2004 the e-business environment in the EU with the annual E-Business Readiness Index.

46. The Joint Research Centre of the European Commission carried out an inventory of risk-related or resilience-related composite indicators and ratings[6] in 2012. It lists 44 indicators with descriptions provided by their authors. Furthermore, the European Commission produces a business climate indicator. Eurostat actively collaborates with the United Nations Statistics Division (UNSD) in this area, namely by coordinating the drafting of the handbook on cyclical composite indicators jointly with the Conference Board.

Sentiment indicators

47. The "Economic Sentiment Indicator" (ESI) is based on monthly sentiment surveys held among businesses and consumers in the EU Member States in line with the Joint Harmonised EU Programme of Business and Consumer Confidence Surveys. It is an average weighted value of confidence indicators in manufacturing, construction, retail trade, services and consumer confidence. In addition, ESI is also calculated for financial services at the EU and Euro Area level. The business surveys are compiled from a subset of questions relating to business managers assessment of recent developments in their business, the current level of stocks, and expectations about a number of economic variables. The consumer survey is twofold: first, it collects information on households' spending and savings intentions, and second, it assesses their perception of the factors influencing these decisions. Eurostat has also organised workshops in this area of work, e.g. a joint EU/OECD Workshop on recent developments in Business and Consumer Surveys that was held on 14-15 November 2013 in Brussels.

48. Eurochambres also conducts a Eurochambres Economic Survey as the source of sentiment indicators on business expectations in Europe. Eurochambres brings national reports and regional data together to prepare a European report on the main trends.

2. European Central Bank

Leading indicators

49. The European Central Bank (ECB) publishes an indicator on Euro Area Industrial New Orders as a leading indicator for euro area industrial production and for cross-checking developments in industrial production in more real-time. The index is published at a delay of approximately 55 days to fill the gap after the requirement to collect data on new orders was removed from an EU regulation. ECB makes use of the large number time series of euro area countries who continued to compile the indicator nationally. For those countries which discontinued the collection of national data, ECB uses model-estimates in calculating the indicator on euro area industrial new orders. New orders are modelled

[6] http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/27384/1/lbna25560enn.pdf

across EU countries using business opinion surveys and industrial turnover in addition to applying a common modelling framework.

50. ECB has also done studies on early warning indicators to identify data and develop methods that would be useful for economic and monetary policies for their leading abilities. One of these studies has shown, for instance, that global indicators including, global GDP, global credit and commodity prices, are the most significant sources of evaluating risks for economies; and housing prices seems to be the most important domestic early warning indicator.

Composite indicators

51. The recent financial and economic crisis revealed gaps in the information basis for analysing, monitoring and controlling systemic risks in the financial system. ECB has, therefore, developed new indicators to fill data gaps. For instance, the Composite Indicator of Systemic Stress (CISS) measures the current state of instability, i.e. the current level of frictions, stresses and strains in the financial system and condenses that state of financial instability into a single statistic. Another example of a composite indicator produced by ECB would be the Financial Market Liquidity Indicator which is part of the ECB's Risk Dashboard Data.

3. International Monetary Fund

Leading indicators

52. An example of a leading indicator, produced by the International Monetary Fund (IMF) is the information on net drains on foreign currency assets up to one year ahead derived from a template on international reserves and foreign currency liquidity. In addition, the quarterly external debt database, maintained jointly with the World Bank, provides information on debt service payment schedule. Also the data on balance sheets of financial institutions, government, and international investment position provide forward looking indicators of potential vulnerabilities arising from counterparty exposures.

Composite indicators

53. From the IMF perspective, leading and composite high frequency indicators are very important for effective surveillance and evidence-based policy making by member countries. The International Monetary Fund (IMF) has developed new indicators and scoreboards to respond to the need for better tools to assess the strengths and vulnerabilities of the financial system. For example the Financial Soundness Indicators and the related Compilation Guide have helped several countries studying the possibility to produce an aggregate financial soundness index.

54. IMF is considering launching work to develop and promote the compilation of high frequency indicators in areas of macroeconomic and financial statistics. IMF has studied the leading abilities of indicators with regard to currency in order to develop a specific early warning system. The system involves monitoring the evolution of several indicators that tend to exhibit an unusual behaviour in the periods preceding a crisis. The variables that have the best track record within this approach include exports, deviations of the real exchange rate from trend, the ratio of broad money to gross international reserves, output and equity prices.

4. Organisation for Economic Co-operation and Development

Leading indicators

55. OECD developed a system of composite leading indicators originally in the 1970's to give early signals of turning points of economic activity. OECD releases Composite Leading Indicators (CLIs) as a subset in the Main Economic Indicators database for 33 OECD countries (Iceland is not included), 6 non-member economies and 8 regional aggregates. The OECD CLIs are calculated by combining component series in order to cover, as far as possible, the key sectors of the economy. The component series cover a wide range of short-term indicators, such as observations or opinions about economic activity, housing permits, financial and monetary data, etc. For each country, the series are selected according to the following criteria: economic significance; cyclical behaviour; and data quality. The OECD system of composite leading indicators is based on the "growth cycle" approach, which measures deviations from the long-term trend. CLIs are designed to provide information on short-term economic movements, especially on turning points.

Composite indicators

56. The Handbook on Constructing Composite Indicators, released in 2008, aims to provide methodological guidance on constructing composite indicators. It was produced jointly by the Organisation for Economic Co-operation and Development (OECD) and the Joint Research Centre (JRC) of the European Commission in Ispra, Italy. The handbook is concerned with those indicators which compare and rank country performance in areas such as industrial competitiveness, sustainable development, globalization and innovation.

57. The Programme for International Student Assessment (PISA) ranks about 70 countries based on an international survey which ranks education systems worldwide by testing the skills and knowledge of 15-year-old students. More than 510,000 students took part in the latest PISA survey, representing about 28 million 15-year-olds globally. The resulting composite indicators evaluate countries in terms of students' scores in mathematics, reading and science.

Sentiment indicators

58. The OECD Consumer Confidence Indicators (CCIs) are based on consumer opinion survey data compiled initially by national statistical institutes, other government agencies, private research institutes, banks, and other research institutes. The consumer opinion survey indicators cover a set of indicators on consumer confidence, expected economic situation and price expectations. OECD standardises the indicators to ensure equal smoothness and the same amplitude of cyclical movements. Consumer Confidence Indicators are not particularly successful in signalling turning points in production; however they capture cyclical patterns in household consumption behaviour fairly well.

59. The OECD Business Confidence Indicators (BCIs) cover a standard set of indicators for four economic sectors: manufacturing, construction, retail trade and other services. For these indicators, OECD uses and standardises the following data from countries: industrial confidence indicator, business confidence indicators, business situation or business sentiment indicators. BCIs tend to have shorter but more stable lead times then the CLIs, and they are subject to little or almost no revision. For all EU Member countries, the series selected are included in the harmonised system of business and consumer tendency surveys managed by the European Commission and are comparable across these countries.

5. United Nations Economic Commission for Europe

60. The Active Ageing Index (AAI), developed by UNECE, is a new composite index covering 28 countries (EU countries and United States). It aims to help policy makers in developing policies for active and healthy ageing. Its purpose is to point to the untapped potential of older people for more active participation in employment, in social life and for independent living. Mobilising the potential of both older women and men is crucial to ensure prosperity for all generations in ageing societies. The indicators are being enlarged to new countries at the moment.

6. United Nations Statistics Division

Leading indicators

61. The United Nations Statistics Division's (UNSD) programme of work has included a number of activities on developing rapid estimates, business cycle indicators and tendency surveys. UNSD organised two seminars on the topic jointly with Eurostat in 2009. The first seminar on Timeliness, Methodology, and Comparability of Rapid Estimates of Economic Trends was held in May 2009 in Ottawa, hosted by Statistics Canada. The second seminar on Early Warning and Business Cycle Indicators, was held in December 2009 in Scheveningen, and was hosted by Statistics Netherlands. The third Seminar on Early Warning and Business Cycle Indicators was held in November 2010 in Moscow, in collaboration with Eurostat and Statistics Netherlands and was hosted by the Federal State Statistics Service of the Russian Federation (Rosstat). The seminars discussed a range of early warning and business cycle indicators, and provided an initial assessment of the challenges and possible strategies for international work in the area.

62. In 2014-2015, UNSD plans to publish three Handbooks on Business Cycle Composite Indicators and on Rapid Estimates (the latter does not directly belong to the scope of this review). The Handbooks aim to provide best practices and harmonized principles on the compilation of these indicators. Thus, they may provide an update to the European Commission and OECD Handbook on Business Tendency Surveys. Eurostat and the Conference Board coordinate the drafting of the handbook on business cycle composite indicators, and Italy the drafting of the handbook on opinion surveys.

Composite indicators

63. In 2012, the UN Statistical Commission endorsed the System of Environmental and Economic Accounting Central Framework (SEEA-CF). It is a satellite account of the System of National Accounts (SNA) and includes a number of composite indicators based on macro-economic aggregates corrected for the depletion of resources, e.g. Depletion Adjusted Net Value Added. While these corrections are limited to only some of the domains of sustainable development, they imply that official statistics are taking on the challenge of complementing traditional economic statistics with new indicators.

64. The United Nations Department of Economic and Social Affairs compiles an Index of Knowledge Societies (IKS) that aims at capturing 45 countries' achievement in the conditions for the development of a Knowledge Society. Such conditions are grouped into three main dimensions: assets, advancement and foresightedness, each of which is measured by a number of underlying indicators.

Sentiment indicators

65. UNSD is drafting in international collaboration a Handbook on Economic Tendency surveys. The first draft Handbook is almost finished, but there were difficulties due to different experience and methodological approaches of countries and due to the need to

harmonise the approach used for tendency surveys with other statistics. The issue will be discussed at the UN Statistical Commission in February 2014.

7. United Nations Development Programme

66. The United Nations Development Programme (UNDP) published a stocktaking report of composite indicators that rank or assess countries according to some economic, political, social or environmental measure which was updated in 2008[7]. The report includes 178 different composite indicators and their brief descriptions. Most of those indicators that are also regularly updated and relevant for the CES countries are included in this review.

67. One of the best known composite indicators is the "Human Development Index" (HDI), which is published annually since 1990 by the UNDP for 177 countries. The first Human Development Report introduced a new way of measuring development by combining indicators of life expectancy, educational attainment and income into a composite indicator. The index measures countries' development as a weighted average of indicators covering economy, education and health.

68. UNDP has developed a composite index on the "Achievement of the Millennium Development Goals" (MDGs) with the World Bank to assess the prospects of low and middle income countries for reaching six of the MDG targets. The countries are classified to four groups describing their likelihood to achieve the goals: likely, possible, unlikely and very unlikely.

69. Gender-related Development Index (GDI), created in 1995, covers 177 countries for which it adjusts the average achievement to reflect the inequalities between men and women in the following: 1) a long and healthy life; 2) knowledge; 3) a decent standard of living.

70. The Gender Empowerment Measure examines whether women and men are able to actively participate in economic and political life and take part in decision-making in 177 countries. It captures gender inequality in: 1) political participation and decision-making; 2) economic participation and decision-making; and 3) power over economic resources.

71. The Human Poverty Index is compiled for two groups of countries: for developing countries and for selected OECD countries. For the first group it measures three dimensions of deprivation: 1) a long and healthy life; 2) knowledge; and 3) a decent standard of living. For selected OECD countries, a fourth dimensions of deprivation, social exclusion, is also measured. The index covers 177 countries, and is produced annually since 1997.

72. The Technology Achievement Index (TAI), introduced in the 2001 Human Development Report, aims to capture how well a country is creating and diffusing technology and building human skills. The index focuses on: 1) creation of technology; 2) diffusion of recent innovations; 3) diffusion of old innovations; and 4) human skills. The index offers rankings for 72 countries for which data were available.

8. United Nations Conference on Trade and Development

73. The United Nations Conference on Trade and Development (UNCTAD) created a Trade and Development Index (TDI) in 2005 to assess the level of trade and development in 110 countries. It measures three dimensions comprising 11 components and 29 indicators: 1) structural and institutional; 2) trade policies and processes; and 3) level of development.

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[7] A stocktaking of composite indicators:
web.undp.org/developmentstudies/docs/indices_2008_bandura.pdf

9. United Nations Educational, Scientific and Cultural Organization

74. The United Nations Educational, Scientific and Cultural Organization (UNESCO) created in 2002 the Education for all Development Index (EDI) to measure the overall progress towards the goal of education for all (EFA). The index captures four goals of the six so called "Dakar main education goals": 1) universal primary education; 2) adult literacy; 3) quality of education; and 4) gender.

75. Furthermore, the gender aspects of education are presented as a separate index – called the Gender-related EFA Index (GEI). The index aims to capture the country's relative achievement in gender parity in participation in primary and secondary education and in adult literacy.

10. United Nations Environment Programme

76. The United Nations Environment Programme (UNEP) collects and releases a number of environmental indicators and collaborates with UNSD to fill data gaps. In the Inclusive Wealth Report 2012 UNEP, jointly with the UN University's International Human Dimensions Programme (UNU-IHDP), presents an index that measures the wealth of nations by a comprehensive analysis of a country's capital assets (manufactured, human and natural) combined into a composite indicator – the Inclusive Wealth Index (IWI). The report suggests that this index be used as a complement to GDP and the Human Development Index (HDI).

77. Another UNEP report, titled Measuring Progress Towards an Inclusive Green Economy, released in 2012, suggests indicators to measure progress towards green economy. The report suggests supplementing GDP with indicators that take into account the value of a country's environmental goods and services, such as forests, air or water resources, as well as human wellbeing and quality of life. The report includes some indicators, such as carbon emissions, carbon price, renewable energy share of the energy mix and investment in "green" research and development that could be used as leading indicators for climate change. The report also suggests valuing natural resource stocks and ecosystem services and measuring the literacy rate of population.

78. UNEP is actively involved in indicator development in various areas related to environment, and notes that there is an urgent need to bring all these efforts in line with each other. Concrete examples of composite indicators by UNEP include the Water Footprint Indicator, the Disaster Risk Index and the National Biodiversity Index. A country's Water Footprint is the total volume of freshwater used to produce the goods and services consumed by its population. The National Biodiversity Index, created in 2001 for 195 countries, uses quantitative data to measure aspects of biodiversity, ecosystem condition, services, and drivers of change to help analyse how biodiversity is changing over time and space, why it is changing, and what the consequences of the changes are for ecosystems, their services, and human well-being. The Disaster Risk Index monitors the evolution of risk by assessing which countries are most at risk considering various types of hazards, such as droughts, floods, cyclones and earthquakes.

79. The Climate Competitiveness Index is a new analysis of how countries create enduring economic value through low carbon technology, products and services. It includes 13 variables examining the degree to which 95 countries have the leadership, institutions, systems and practices in place for climate competitiveness.

11. United Nations Public Administration Network

80. United Nations Public Administration Network (UNPAN) created in 2003 the E-Government Readiness Index which is a composite measure of the capacity and willingness of countries to use e-government. It ranks government's efforts while taking into account

their size, infrastructure availability and penetration of information and communication technologies and the level of education and skill development. The index assesses 50,000 features for 191 countries. UNPAN also compiles an E-Participation Index to assess the willingness of countries to engage citizens in public policy making through the use of the e-government programs. Other ICT related indices also exist.

12. World Bank

81. Since 2005 World Bank has produced a Total Wealth and Genuine Savings Index which is a new estimate of total wealth, including produced capital, natural resources, and the value of human skills and capabilities. The index provides a ranking of 118 countries showing that many of the poorest countries in the world are not on a sustainable path. Another composite indicator produced by the World Bank is the Adjusted Net Saving (ANS) that builds on gross national savings but adjusts it for developments in natural, economic and social assets.

82. The World Bank's International Development Association (IDA) compiles the Country Policy and Institutional Assessment (CPIA) index for allocating their resources for 81 countries. This index assesses the quality of countries' policies and institutions, to arrive at an equitable distribution of IDA's funds among countries. The index assesses policy and institutional frameworks for fostering poverty reduction, sustainable growth and the effective use of development assistance.

83. The World Bank Institute compiles, since 1996, Governance Indicators for 199 countries that determine how authority is exercised in the country for the common good, encompassing: 1) the process of selecting, monitoring, and replacing governments; 2) the capacity to formulate and implement sound policies and deliver public services; and 3) the respect of citizens and the state for institutions.

84. The "Ease of Doing Business", developed in 2004, is a simple average of the country's ranking in 7 areas of business regulation and property rights protection in 145 countries: 1) starting a business; 2) hiring and firing workers; 3) registering property; 4) getting credit; 5) protecting investors; 6) enforcing contracts; and 7) closing a business. It measures government regulations and their effect especially on small and medium sized domestic firms. The data are based on research of laws and regulations with input and verification from 3,000 local government officials, lawyers, business consultants and other professionals.

13. World Economic Forum

85. The Global Competitiveness Report 2013-2014 assesses the competitiveness of 148 economies, providing insight into the drivers of their productivity and prosperity. The Global Competitiveness Index (GCI), created in 1999, ranks 104 countries using statistical data such as enrolment rates, government debt, budget deficit, and life expectancy, obtained from internationally recognized agencies, notably the World Bank, IMF, UNESCO, and WHO. Furthermore, the GCI uses data from the World Economic Forum's annual Executive Opinion Survey to capture issues that require a qualitative assessment or for which internationally comparable statistical data are not available. The Global Competitiveness Index is a weighted average of three sub-indices: basic requirements, efficiency enhancers and innovation factors.

86. The Gender Gap indicator, developed in 2005, measures the extent to which women have achieved full equality with men in 58 countries in five areas: 1) economic participation; 2) economic opportunity; 3) political empowerment; 4) educational attainment; and 5) health and wellbeing. The indicator makes use of the World

Development Indicators of the World Bank, and the Human Development Report of UNDP, as well as the annual Executive Opinion Survey of the World Economic Forum.

87. The Innovation Capacity Index was also produced under the auspices of the World Economic Forum in 2001-2002 for 75 countries. It measures country's innovation capacity as a composite indicator of: 1) the proportion of scientists and engineers; 2) innovation policy; 3) cluster innovation environment; and 4) linkages.

88. The Networked Readiness Index measures the degree of preparation of a nation or community to participate in and benefit from ICT developments. 104 countries are ranked from highest to lowest readiness annually and the index exists from 2001.

14. World Health Organisation

89. "Overall Health System Achievement Index and Overall Health System Performance Index" were developed by World Health Organization (WHO) in 2000 covering 191 countries. The first composite indicator measures achievement in the level of health, distribution of health, level of responsiveness, distribution of responsiveness and fairness of financial contribution based on a survey of one thousand public health practitioners. The second index of performance reports how efficiently health systems translate expenditure into health.

90. The Global Burden of Disease indicator of WHO measures burden of disease using the disability-adjusted life year method. It was developed in 1990 to assess the burden of disease consistently across diseases, risk factors and regions.

B. International indicators developed by NGOs, academia and private companies

91. Several environmental indicators such as the Environmental Degradation Index (EDI), Environmental Sustainability Index (ESI) and Environmental Vulnerability Index (EVI) are produced by academics and research institutes.

92. The World Wildlife Fund developed one of the most influential indicators in 2000, namely the Ecological Footprint to measure the consumption of renewable natural resources in 148 countries. Ecological Footprint is the total area of productive land or sea required to produce all the crops, meat, seafood, wood and fibre the population consumes, to sustain its energy consumption and to give space for its infrastructure.

93. Germanwatch and Climate Action Europe produce a Climate Change Performance Index (CCPI) for 58 countries to combine the per-capita emission trend, absolute energy-related CO_2 emissions and climate policies into one indicator. The Climate Change Vulnerability Index (CCVI) by Maplecroft evaluates 42 social, economic and environmental factors to assess national vulnerabilities. Another climate composite indicator is the Global Climate Change Policy Tracker of the Deutsche Bank which provides investors with an analysis of climate change policies and assigns a risk rating to 109 countries, states and regions.

94. Other examples of environmental composite indicators include the Happy Planet Index (HPI), the Sustainable Society Index (SSI) of the Nederlandduurzaam, the Living Planet Index (LPI) of the World Wide Fund (WWF) and the Sustainability Index of the Zurich Cantonal Bank (ZKB). The *Happy Planet Index* (HPI), developed by the Friends of the Earth in 2006, measures the ecological efficiency with which wellbeing is delivered in 178 countries. It is the first index to combine environmental impact with wellbeing to measure the environmental efficiency.

95. One of the most well-known economic indicators is the Economist's Big Mac Index covering 120 countries. The index is based on the Purchasing Power Parities (PPP) and aims to foresee if the currency of a country is at the right level using as a basket the Big Mac hamburger. If the actual exchange rate is higher than the Big Mac PPP, the index considers that the currency is undervalued.

96. Several composite indicators measure economic risks and vulnerabilities. For example, the Ducroire/Delcredere Country Risks classifies 239 countries into three categories according to the intensity of commercial risk. Other related indicators include the Economic Vulnerability Index, Institutional Investor Country Credit ratings, International Country Risk Guide Rating and the Grey Area Dynamics. These identify key emerging sources of risks to business.

97. The Business Environment Risk Intelligence (BERI) provides many composite indicators to monitor business environment: Lender's Risk Rating (50 countries), Financial Ethics Index (115 countries), Quality of Workforce Index (42 countries) and a Composite Score of Risk (50 countries). Business environment can also be monitored in 161 countries with the Index of Economic Freedom which brings together 50 economic variables to assess government coercion or constrains and is produced jointly by Heritage Foundation and Wall Street Journal.

98. Concerning economic conditions of countries, the Forbes' Tax Misery and Reform Index analyses the top marginal rates of taxation of and payments on corporate income, personal income, wealth, employer social security and sales. The Fraser Institute compiles an Economic Freedom of the Word Index to measure how supportive policies are of economic freedom in personal choice, voluntary exchange, freedom to compete, and security of privately owned property in 123 countries. The Milken Institute compiles the Capital Access Index (CAI) which scores the ability of entrepreneurs to gain access to financial capital in 85 countries.

99. Globalization Indicators are compiled by World Markets Research Centre for 185 countries in the form of an assessment of economic interdependence and connectivity and by Foreign Policy with AT Kearney for 62 countries to measure four dimensions: political, technological, personal and economic. The Global Retail Development Index of AT Kearney ranks the attractiveness of 30 top emerging countries for retail business. AT Kearney also produces a Foreign Direct Investment Confidence Index with the Global Business Policy Council to gauge the likelihood of investment in specific markets in order to gain insight into likely trends in future global FDI flows in 42 countries.

100. Economist Intelligence Unit (EIU) compiles many composite indicators, such as the World Wide Cost of Living Index in 130 cities of 90 countries, Country Risk Ratings for 100 developing and highly indebted countries and Business Environment Rankings measuring the quality and attractiveness of the business environment for 60 countries. It also produces a Country Risk Rating to assess the foreign direct investment (FDI) climate for 202 countries based on six dimensions (political, economic, legal, tax, operational and security). The Political Instability Index shows the level of threat posed to governments by social protest, and the E-Readiness Ranking the extent to which a country's business environment is conducive to Internet-based commercial opportunities.

101. The International Institute for Management Development produces an aggregated World Competitiveness Scoreboard, since 1989, to rate 60 countries based on their performance in the economy, government, businesses and infrastructure.

102. Gallup's World Poll sentiment indicators span more than 150 countries annually measuring what the world's adult population thinks about topics from basic needs to job creation. Gallup typically surveys 1,000 adults in each country once a year, using a standard

set of questions translated into the major languages of the respective country. The survey covers topics such as macroeconomics; personal security related to law and order; having enough money to provide food and shelter; infrastructure, including roads, education, environment, healthcare, and housing; jobs; wellbeing; people's attachment to their communities and opinions on the performance of the country's leaders.

103. Various governance indicators are produce to rank governments' performance. Transparency International compiles the Corruption Perception Index to rank countries in terms of experts' perception of corruption for 145 countries. It is a composite index based on surveys of business people and assessments by country analysts. Similarly, the Global Integrity Index of the Center for Public Integrity assesses anti-corruption mechanisms in 41 countries. Other governance indicators include Failed States Index, Index of State Weakness, Least Secure Countries, Open Budget Index and the Commitment to Development Index.

104. A Press Freedom Index was developed by Freedom House in 1980 to annually assess the degree to which 192 countries permit the free flow of information. Similarly, the International Research and Exchanges Board provides a Media Sustainability Index for an analysis of the conditions for independent media in 20 countries across Europe and Eurasia. Freedom House also compiles a number of composite indicators on governance issues, such as "Countries at the Crossroads" (to evaluate the performance of 70 governments in: accountability and public voice; civil liberties; rule of law; and anticorruption and transparency); "Democracy Score" (to assess 27 countries on how democratic or authoritarian the countries are) and "Political Rights and Civil Liberties Rating" (to measure freedom in 192 countries according to two categories: political rights and civil liberties).

105. Many indicators dealing with social issues are not produced regularly due to the lack of existing data and the burdensome data collection and analysis processes. However, the Social Watch produces annually a Basic Capabilities Index (BCI) which was originally developed in 2004 as Quality of Life Index. It covers 94 countries and focuses on child health, under-5 mortality and the percentage of births attended by skilled health personnel. Social Watch also compiles a Gender Equity Index (GEI), created in 2004, to rank 134 countries according to their performance in the dimensions relating to gender equity.

106. Another quality of life indicator is produced by Mercer Human Resource Consulting to analyse the difference in the Global Quality of Living between cities using data on consumer goods, economic environment, housing, medical and health considerations, natural environment, political and social environment, public services and transport, recreation, schools and education, socio-cultural environment. The Food Security Risk Index released by Maplecroft is specialised in evaluating risks to the supply of basic food for 163 countries.

107. Save the Children compiles "the Mothers' Index" to assess women's and children's well-being. The index relies on published information on: 1) risk of maternal mortality; 2) women using modern contraception; 3) births attended by trained personnel; 4) pregnant women with anemia; 5) adult female literacy rate; 6) participation of women in national government.

108. Ruut Veenhoven has carried out surveys since 1984 to form a "Happiness Index" that provides rankings of average happiness, happy life years, equality of happiness and inequality adjusted happiness. The surveys cover 90 countries.

109. A group of researchers (from the Universities of Geneva (UNIGE) and Fribourg (UNIFR), the Observatoire de la Finance of Switzerland and some international organizations) is planning to conduct a project on composite indices used for country rankings. The idea of the project is to analyse these indices regarding their structure and

data used, link to the corresponding theoretical concepts as well as the behaviour of the indices.

V. Issues and challenges

A. How should national statistical offices react?

110. This section is also based on the small UNECE survey. One question of the survey explored views on how the national statistical offices should react to the challenge with regard to the leading, composite and sentiment indicators.

111. In the replies, statistical offices emphasized the need to constantly monitor the development of users' interests in these indicators, and to be supportive of the information needs by providing the data available at the NSOs.

112. Some statistical offices suggested organising regular meetings with key data users or conducting tailored user surveys to explore information needs especially for support needed for environmental, fiscal and monetary policies in the form of accurate and timely data. A few NSOs prefer promoting the use of scoreboards of indicators instead of compiling composite indicators.

113. Countries suggested that development work be carried out at international level with NSOs' involvement to reduce costs and increase benefits of learning from each other. NSOs should review the results of international work and share good practices. This would entail exploring the different methodologies used, learning from best practices and if required, requesting for support for the development work. An NSO mentioned that there are about 450 indicators on environmental issues only. International cooperation would be needed to identify the key indicators for NSO involvement.

114. In general, producers of official statistics should be open to the need for leading, composite and sentiment indicators, at least by collaborating with researchers and other agencies compiling them. Some NSOs raise the question whether statistical offices should be at all involved in producing indicators that are based on econometric modelling. On the other hand, nowcasting was mentioned as one such method, which is a common practice in many statistical offices.

115. The prerequisite for NSOs could be that they will engage only in the compilation of reliable figures. There should be an internationally agreed framework and indicators before NSOs get actively involved. Finland mentions that development of internationally agreed indicators and frameworks, for instance on wellbeing and sustainable development should be continued. NSO's role would then be clearer - to contribute by providing the information needed for the agreed frameworks.

116. Some NSOs also suggest that the statistical community should provide statistical expertise to the development and reporting of leading, composite and sentiment indicators even when they are produced outside the national statistical system. They note that NSOs could contribute to improving the reliability and usefulness of these indicators for policy making, for instance, to ensure that proper metadata is available and that the methodologies used are internationally agreed and improved if need be. Working collaboratively with other producers and researchers in developing these indicators further would probably also reduce costs.

117. Developing new indicators based on existing data is important for keeping costs and response burden under control. NSOs should, therefore, participate in the development of the indicators in areas where existing data sets can be used to avoid launching new data

collections. Many NSOs are also experienced in nowcasting methods, for instance for GDP, and similar methods could be useful for other indicator needs.

118. NSOs should intervene when the existing indicators are misused or misinterpreted. They could support carrying out studies and take part in debates on the proper use and correct interpretation of these statistical tools.

119. Several statistical offices reported that more resources would be needed if the NSO was to enlarge its activities to compile new leading, composite and sentiment indicators. Answering new information needs requires sufficient resources, trained staff and the necessary technical and material tools. Therefore, NSOs and the international organisations should promote these indicators and put effort into getting support from governments for the work.

120. Finally, it would be in everyone's interest if the leading, composite and sentiment indicators were compiled based on harmonized and sound methodologies by reusing statistical data that is readily available and comparable across countries.

B. Key issues to be considered

1. Leading indicators

121. Some statistical offices already produce leading indicators, whereas some are produced by central banks, research institutes or private companies. These are often economic indicators, on which statistical offices have a lot of data and knowledge. However, there may be issues with reliability of estimates and the use of econometric modelling within official statistics. On the other hand, producing leading indicators can boost the image of the statistical office as a provider of timely data. The related issues are:

- Which are the indicators where NSOs could best contribute?
- Which are the leading indicators that allow for predicting changes in the economy in a most reliable way? Is it better for NSOs to focus to nowcasting of existing indicators or to compile composite leading indicators?
- Would it be useful to develop leading indicators for social and environment statistics? These could be indicators that help anticipate changes in societal wellbeing or that monitor drivers of environmental changes. It could be useful to do a study, in collaboration with the academia, to identify a list of potential leading indicators for different statistical areas and exchange experience in this area.

2. Composite indicators

122. There are different kinds of composite indicators some of which are produced by official statistics (e.g. GDP). Weighting and aggregation of the different variables is the key concern that affects the reliability of the indicators. Selection of weights and methods to merge data measured in different units require judgement. Issues here are related to whether, where and how official statistics should be involved:

- What could be the criteria on what kind of composite indicators statistical offices could be involved in producing? When are composite indicators in line with the principles of producing official statistics?
- How to avoid misinterpretation? How should NSOs react if composite indicators are based on official statistical data but present a distorted picture of reality?
- Would it be useful for NSOs to be involved in partnerships with academia or other producers of composite indicators? What should be the goal of such collaboration?

3. Sentiment indicators

123. NSOs are increasingly getting involved in compiling subjective indicators and some NSOs compile consumer and/or business confidence indicators. The issues here mainly deal with combining the role of NSOs as a producer of objective statistics with the actual production of statistics based on sentiments, feelings and expectations:

- How to deal with the potential risk to the credibility of the statistical office?
- How useful are the current subjective indicators or sentiment indicators – Do they help anticipate future development? How to deal with their volatility? How to identify and explain the reasons for increase or decrease in sentiment indicators?
- What could be the criteria for defining what kind of sentiment indicators statistical offices could produce?

124. A crosscutting issue regarding the threats and opportunities for NSO involvement is communication. To what extend could good communication solve the potential threats related to NSO involvement in leading, composite or sentiment indicators?

VI. Conclusions and recommendations

A. Conclusions

125. NSOs are already very much involved in producing leading, composite and sentiment indicators. At international level, a number of international organisations (e.g. according to the UNDP stocktaking report) are involved in producing or developing composite indicators and the academia are carrying out various research projects to study them (the project of the Universities of Geneva and Fribourg etc.).This is potentially on area where official statistics could cooperate for the benefit of all stakeholders.

126. The following conclusions can be made from the overview of national and international statistical activities in leading, composite and sentiment indicators:

(a) These indicators create a lot of debate for instance around country rankings on specific issues such as competitiveness or wellbeing. The debate underlines the demand for this information. Policy makers are also increasingly referring to composite indicators;

(b) A considerable number of different indicators exists and new indicators emerge constantly. It is difficult for users to assess the quality and reliability of the different indicators, and NSOs have problems in deciding where to get involved;

(c) Despite some level of harmonization in the EU, this area of work is highly fractioned and the producers of similar indicators vary across countries;

(d) Official statistics are increasingly reacting to the challenge of complementing traditional statistics with new leading, composite and sentiment indicators. Users request for focused scoreboards or composite indicators that are easier to compare and analyse and can be compiled faster;

(e) It is not clear what the role of national statistical offices should be with regard to these indicators. Should NSOs take a greater role in the development and production of leading, composite and sentiment indicators on key topics? Should they be more active in providing data for these purposes or also offer their competence for improving the quality of the existing indicators? Should NSOs intervene in the use and misuse of these indicators?

B. Possible further work

127. The UNECE survey asked statistical offices whether there is a need for international work to be undertaken related to the leading, composite and sentiment indicators and official statistics. While some countries do not see this area as a priority, a number of NSOs noted that it would be important to agree on common priorities and the way forward at international level. The following options for possible ways forward were identified mainly based on the replies to the survey:

(a) Developing a quality checklist for users: Some NSOs suggest that users need guidance for assessing the quality and reliability of existing leading, composite or sentiment indicators, and a specific evaluation criterion, checklist or a quality framework would be helpful;

(b) Identifying problems of NSOs: The survey replies highlighted many problems and challenges for NSOs concerning leading, composite and sentiment indicators that should be identified and then addressed by agreeing on the way forward internationally;

(c) Defining the role of official statistics: The views of NSOs regarding their role in this area were diverse. It might be helpful to define their responsibilities and boundaries with regard to leading, composite and sentiment indicators. Selection criteria for types of indicators for NSO involvement could also be developed, including for instance high policy relevance of the indicator, availability of well-developed methodology and analytical soundness of the indicator;

(d) Defining the key indicators where NSOs could be involved: Many indicators exist currently which makes it difficult for NSOs to get involved. The key indicators in which NSOs could be involved should be defined internationally;

(e) Harmonising methodologies further: Several NSOs see a need to improve comparability and reliability of these indicators by developing practical guidance including definitions, recommendations and description of best practices even if these indicators were not produced by NSOs;

(f) Enhancing the role of official statistics: Some NSOs suggest that leading, composite and sentiment indicators should be developed based on the methodological standards of official statistics, which should be agreed upon internationally. Key indicators should be compiled under the status of official statistics.

128. Countries suggested increasing cooperation and exchange of good practices by:

- Closer cooperation among international organizations.
- Seminars and training workshops to increase understanding of this area.
- Capacity building activities for the countries with less developed statistical systems.